

**Amendment 91-216****Navigational Equipment Requirement in a Terminal Control Area (TCA),  
Visual Flight Rules (VFR) Operations****Adopted: June 11, 1990****Effective: July 18, 1990  
& August 18, 1990****(Published in 55 FR 24822, June 18, 1990)**

**SUMMARY:** This action removes the navigational equipment requirement for aircraft operations conducted under visual flight rules (VFR) in a terminal control area (TCA).

**EFFECTIVE DATES:** The amendment to § 91.90(c) is effective July 18, 1990. The amendment to § 91.131 is effective August 18, 1990.

**FOR FURTHER INFORMATION CONTACT:** Mr. A. Wayne Pierce, Air Traffic Rules Branch, ATP-230, Airspace Rules and Aeronautical Information Division, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, telephone (202) 267-8783.

**SUPPLEMENTAL INFORMATION***Background*

On October 6, 1988, the Federal Aviation Administration (FAA) issued Amendment Nos. 61-80, 71-11, and 91-205, Terminal Control Area (TCA) Classification and TCA Pilot and Navigational Equipment Requirements (53 FR 40318). Those amendments require, among other things, all aircraft operating in a TCA to be equipped with very high frequency (VOR) or ultra-high frequency tactical air navigational aid (TACAN) navigational equipment, thereby eliminating, effective July 1, 1989, the previous exclusion from this requirement for helicopters.

On April 3, 1989, the Helicopter Association International (HAI) petitioned the FAA for an exception to the navigational equipment requirement for helicopters conducting operations under VFR or special visual flight rules (SVFR) in a TCA. Pending a final disposition of the HAI petition, and in contemplation of a related rulemaking proposal, the FAA amended the TCA Classification and TCA Pilot and Navigational Equipment Requirements final rule to delay the effective date of the equipment requirement applicable to helicopters until January 1, 1990 (54 FR 24882; June 6, 1989).

In response to the HAI petition and after review of the need for the navigational equipment requirement, the FAA proposed to eliminate the navigation equipment requirement for aircraft conducting operations under VFR in TCA (Notice No. 89-17; 54 FR 26782; June 26, 1989). While the comment period closed on July 26, 1989, the FAA determined that further internal review and coordination with its field offices was necessary before a final determination could be made on the proposal. Therefore, the FAA further delayed the effective date of the equipment requirement for helicopters operating in a TCA until October 1, 1990 (55 FR 412, January 4, 1990), pending that determination.

*Discussion of Comments*

Nine comments were received in response to Notice No. 89-17. Commenters included the Air Transport Association of America, the Soaring Society of America, the National Association of State Aviation Officials, the Air Line Pilots Association, the National Air Traffic Controllers Association, and others. The following discussion summarizes the substantive comments received on the proposal.

One commenter stated that adoption of the proposal would be counter to two recommendations made by the TCA Task Group formed by former FAA Administrator Donald Engen. The recommendations advised the FAA to study the feasibility of (1) establishing TCA boundaries based on reference to an on-airport VOR and (2) the use of "gateway" VOR's for advisory service at each TCA.

Both recommendations were studied and neither was adopted as FAA policy for universal application at TCA locations. Therefore, on-airport VOR's and gateway VOR's have not been established at

many TCA's, and the recommendations are not appropriate as a basis for requiring VOR equipment for VFR operations at all TCA's.

Other commenters recommended retaining the VOR/TACAN equipment since many TCA boundaries are based on radials and distances, based on distance measuring equipment (DME), of VOR's (VOR/DME or VORTAC).

The FAA uses both VOR/DME references and/or references to prominent visual landmarks when defining TCA boundaries. Although, in many instances, VOR/DME references are used to identify TCA boundaries, such use does not preclude visual reference to the surface as an acceptable means of navigation—it merely complements pilotage. TCA boundaries are depicted on charts used for VFR flight operations and, as such, the boundaries can be associated with visual landmarks regardless of the use of VOR/DME references in defining those boundaries. However, the reasons for depicting such boundaries are to help those pilots who are trying to avoid a TCA to remain outside the TCA, and to assist pilots of large turbine-powered aircraft to operate above the floors of the TCA. It is significant that the equipment requirement pertains only to operations conducted within the TCA. Therefore, the fact that some boundaries are defined with reference to electronic navigational aids is not relevant to the equipment requirement.

The FAA recognizes the usefulness of VOR radials as an aid to pilots operating properly equipped aircraft when reference to the surface cannot be maintained and the aircraft is operating within, or in proximity to, a TCA. However, operations conducted under VFR can be accomplished by pilotage, dead reckoning, or with the aid of instrument navigation systems other than VOR or TACAN, e.g., Loran C, Omega, etc.

Comments also addressed the establishment and charting of VFR transition routes for operations through TCA's. Some commenters objected to elimination of the VOR/TACAN requirement based on the belief that such action would negate the usefulness of such routes.

Transition routes are established to facilitate VFR operations through the TCA. These routes are sometimes described by referring to prominent landmarks. In other instances, transition routes are based on reference to a VOR, and in still others, they are described by using a combination of VOR radials and visual landmarks or pilotage. When the route is defined by reference to a VOR, that method of navigation may become the primary means for flying the route. However, other navigational methods, such as area navigation, Loran C, or in the near future, Global Positioning System (GPS), may also be used. When the route is described by reference to visual landmarks or by a combination of landmarks and VOR signal, reference to VOR provides an alternative means of navigation for aircraft so equipped.

When aircraft are cleared to operate under VFR along transition routes defined by VOR radials, controllers rely on compliance with those clearances and routes. An operator who is unable to comply would then request alternate instructions. The FAA anticipates that the need for alternate instructions based on the elimination of the requirement for aircraft under VFR operation to carry a VOR receiver will be rare. That belief is based on the following. Only approximately 10 percent of all general aviation aircraft in the United States are currently without a VOR receiver; the use of radar vectors and visual landmarks is prevalent as the basis for air traffic control (ATC) clearances to VFR flights within TCA's; and the trend is growing for general aviation operators to install other navigational systems, such as Loran C.

An organization representing air traffic controllers objected to the proposal based on the traffic complexity and density associated with TCA's. Further, the organization cited a need to control aircraft operating within TCA's and recent FAA initiatives (such as the Mode C transponder requirement) to improve safety in and around TCA's as rational for retaining the equipment requirement.

The FAA agrees that a high level of control over aircraft operations within TCA's is essential to flight safety. Such control is facilitated by the requirements for two-way radio communications and ATC clearances to operate within any TCA. VFR operations can be adequately controlled by limiting the areas, routes, and altitudes of the aircraft's operation. Normally, such limitations are accomplished by issuing clearances which use radar vectors, reference to visual landmarks, or VOR references. While sometimes those clearances would require reference to a VOR facility to comply, the FAA believes that clearances using VOR radials for VFR navigation are the least used of the available options. Even those clearances which use VOR references can often be complied with by the use of other electronic navigational equipment, such as Loran C or other area navigation equipment.

One organization stated that it does not believe that VOR is the only means of ensuring a consistent navigational capability; however, it contends that since the general aviation fleet most impacted by the requirement is already VOR-equipped, continuance of the requirement does not constitute an undue burden on VFR operators.

The FAA agrees that the majority of general aviation aircraft is equipped with VOR receivers. Industry estimates indicate that 89.5 percent of general aviation aircraft are VOR-equipped. It can also be presumed that the vast majority of those non-equipped aircraft normally operate in areas other than TCA's. The FAA does not believe that eliminating the VOR equipment requirement associated with TCA's will result in operators removing such equipment from their aircraft. The probability is that most general aviation aircraft that operate in proximity to TCA's are VOR-equipped, notwithstanding the requirements of Section 91.90. However, the FAA has determined that it is not necessary for aircraft operated under VFR in a TCA to carry VOR equipment to maintain the current high level of safety for operations in that airspace. Furthermore, any burden, financial or otherwise, caused by an unnecessary regulation is unwarranted.

Another organization asserted that FAA pilot training and written test requirements were sufficient basis for retaining the VOR requirement for operations in a TCA. That organization believes that VOR provides a means of precise navigation and that the ability to precisely navigate when operating in a TCA is essential.

Elementary instruction regarding VOR equipment, airways, and instrumentation is provided in basic flight training; however, the FAA does not believe that the receipt of that basic training is sufficient justification for requiring VFR operators to carry VOR equipment. Pilots are required, during the certification flight-check, to demonstrate an ability to operate and navigate by reference to whatever navigational system is installed in the aircraft—not necessarily VOR.

The FAA agrees that reference to VOR provides a means of precise navigation. However, the usefulness of a VOR for precise navigation through a TCA presumes that the intended, or assigned, route of flight is facilitated by a VOR along that route. Very often VOR radials are not used to define a route of flight through a TCA. Although precise navigation is useful, it is not essential to VFR operations, particularly since most VFR operations through a TCA are authorized without specific routings or along routes depicted with surface references. Other types of navigational equipment, such as Loran C, can provide an adequate means for precise navigation for VFR flights.

One organization contends that pilots may be delayed or denied access to the TCA if the aircraft is not capable of navigating by reference to a VOR.

The FAA disagrees with the contention that pilots would be denied access or delayed access to a TCA because the aircraft is not VOR-equipped. Although VFR routes are being charted through TCA's and, when possible, reference to a VOR is being included, these routes are not predicated upon VOR navigation alone. Navigating by visual reference to the surface is and will remain an acceptable option, with VOR as an alternative method for those operators preferring to navigate via VOR reference. The use of VOR radial and reference to DME in the design of a TCA is not intended for facilitating operations within the TCA; conversely, such reference is to facilitate operators of appropriately equipped aircraft from transgressing TCA boundaries.

Several commenters stated that alternative navigational systems that are available for VFR operations in a TCA could be added to the VOR or TACAN required equipment options.

The FAA agrees that several area navigation systems are being used by operators as secondary means of navigation, or as a primary means when VOR is available for cross reference. However VOR remains the primary instrument navigation system, and reliance on those area navigation systems is contingent on VOR reference. Although area navigation systems are installed in many aircraft not equipped with VOR, such systems are not approved for instrument flight rules (IFR) navigation in the Nation's airspace system. The FAA does not consider requiring a navigation system that is not approved for both VFR and IFR navigation as appropriate. However, by eliminating the equipment requirement for VFR operations, the FAA has, in effect, allowed use of any navigational aid the operator considers suitable for the operation being conducted.

Several commenters expressed concern regarding operations conducted in or through a TCA when the aircraft would be operated above a layer of clouds or surface based obscuration which precludes pilotage in a non-equipped aircraft.

When granting authorization to enter or transit a TCA, ATC may issue instructions which include a route and altitude requisite to the authorized operation. As with any ATC instruction, the pilot is required to advise ATC if compliance with that instruction cannot be accomplished. The FAA acknowledges that many such authorizations are contingent on following a route that requires either VOR navigation or pilotage. A pilot's inability to comply with the ATC-issued routing may result in denial or delay of the pilot's request for TCA access during periods when traffic or controller workload precludes authorizing the operation along a pilot-elected route or controller-assigned routing. The FAA believes the potential for such delays or denials regarding ATC authorization for access to a TCA may be a factor in operators electing to equip their aircraft with a VOR receiver. The FAA considers that the simultaneous occurrence of all these factors— pilotage is not possible, the aircraft is not VOR-equipped, and ATC cannot allow the pilot to operate with a degree of latitude or provide radar vectors— will be no greater than already exists. Furthermore, such an occurrence would result in an individual delay or denial regarding a TCA operation and as such does not warrant requiring all operators to be VOR-equipped.

#### *Need for Regulation*

The FAA has determined that a requirement for aircraft being operated under VFR is not necessary to maintain safety in TCA's and that the continuation of such a requirement could pose an unnecessary burden on aircraft operators.

#### *The Rule*

Accordingly, the FAA is amending the regulation to remove the VOR/TACAN navigational equipment requirement for aircraft operations conducted under VFR. VOR/TACAN navigation equipment will only be required for operations conducted under IFR.

### Regulatory Evaluation Summary

#### *Introduction*

Executive Order 12291 dated February 17, 1987, directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society for the regulatory change outweigh the potential costs to society. The order also requires the preparation of a Regulatory Impact Analysis of all "major" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is likely to result in an annual effect on the economy of \$100 million or more, a major increase in consumer costs, a significant adverse effect on competition, or is highly controversial.

The FAA determined that this final rule is not "major" as defined in the executive order, so a full regulatory evaluation of alternative approaches has not been prepared. A more concise regulatory evaluation has been prepared, however, which includes an analysis of the safety and economic consequences of this rule. This analysis is included in the docket, and it quantifies, to the extent practicable, estimated costs to the private sector, consumers, Federal, State, and local governments, as well as anticipated benefits and impacts.

A summary of the regulatory evaluation is contained in this section. For a more detailed analysis, the reader is referred to the full evaluation contained in the docket.

#### *Costs*

This rule is relieving in nature and will impose no costs on either society or aircraft operators/owners. This assessment is based on rationale contained in the following discussion for each of these groups.

#### *Impact on Society*

In terms of society, this rule will not impose any additional costs in the form of a reduction in aviation safety.

After a reexamination of the need for VOR/ TACAN, which was in part prompted by the petition from Helicopter Association International, the FAA concludes that there is

no longer a need to require VOR/TACAN navigational equipment for aircraft conducting operations in a TCA under VFR and that adequate aviation safety will still be maintained. Under this rule, aviation safety will remain intact by employing the use of one of two options for operations in a TCA conducted under VFR: (1) flight operations with navigational equipment or (2) flight operations without navigational equipment. With navigational equipment, a pilot operating under VFR will have the option of using either VOR/TACAN or other types of navigation equipment (namely, LORAN C). Either type of navigational equipment selected will continue to ensure that the current level of aviation safety remains intact. Without navigational equipment, a pilot operating under VFR conditions while in a TCA will be allowed to use pilotage or deadreckoning procedures (for example, visual landmarks or radar vectors). This option will also ensure that an adequate level of aviation safety remains intact.

#### *Impact on Aircraft Operators/Owners*

Aircraft operators/owners will not be adversely impacted by this rule because it is cost relieving in nature. Aircraft operators will no longer be required to equip their aircraft with VOR/TACAN navigational equipment for operations in a TCA under VFR. This action will only impact those aircraft operators without VOR/TACAN navigational equipment who would have elected to operate under VFR in a TCA in the absence of this rule.

The options of operating either with or without navigation equipment, as promulgated by this rule, will allow aircraft operators more flexibility to operate under VFR in a TCA while maintaining a sufficient level of aviation safety.

#### *Benefits*

The primary benefit of this rule is the elimination of a cost burden for aircraft operators/owners (namely, rotorcraft types) who operate in a TCA under VFR without VOR/TACAN navigational equipment before October 1, 1990. The secondary benefit of this rule is flexibility afforded to aircraft operators/owners by allowing the option of using navigational equipment other than VOR/TACAN or no equipment while operating under VFR in a TCA.

As of October 1, the delayed effective date of the navigational equipment requirement under Amendment Nos. 61-80, 71-11, and 91-205, (Terminal Control Equipment Requirements; 53 FR 40318), will expire. Those amendments essentially require all aircraft operating in a TCA to be equipped with VOR or TACAN navigational equipment and were initially scheduled to become effective July 1, 1989. However, this effective date was delayed for operators of helicopters until October 1, 1990. This cost relieving benefit will be realized without jeopardizing safety.

#### *Conclusion*

In view of the estimated zero cost of compliance, coupled with the elimination of a cost burden without jeopardizing aviation safety, the FAA finds that this final rule is cost-beneficial.

#### *International Trade Impact Statement*

This rule will have no effect on the sale of foreign aviation products nor services in the United States, nor any effect on the sale of U.S. projects or services in foreign countries. It will neither impose costs on aircraft operators nor U.S. or foreign aircraft manufactures.

#### *Regulatory Flexibility Determination*

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress to insure, among other things that small entities are not disproportionately affected by Government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities." The small entities which could be potentially affected by the implementation of this rule are unscheduled operators or aircraft for hire owning nine or fewer aircraft.

As discussed above, only those unscheduled aircraft operators (namely, rotorcraft) without VOR/TACAN navigational equipment who operate under VFR in a TCA will be impacted by this rule. These operators will be impacted in the form of a cost relieving nature. Since this rule will not impose any costs on aircraft operators, the FAA finds that it will not have a significant economic impact, positive or negative, on a substantial number of small entities.

#### *Federalism Implications*

The regulation herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

#### *Conclusion*

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination, the FAA has determined that this regulation is not major under Executive Order 12291. In addition, the FAA certifies that this regulation will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. The regulation is not considered significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A regulatory evaluation of the regulation, including a Regulatory Flexibility Determination has been placed in Docket 25943. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

#### *The Amendment*

Accordingly, pursuant to the authority delegated to me, the Federal Aviation Administration amends Part 91 of the Federal Aviation Regulations (14 CFR Part 91) effective July 18, 1990 & August 18, 1990.

The authority citation for Part 91 continues to read as follows:

*Authority:* 49 U.S.C. 1301(7), 1303, 1344, 1348, 1352 through 1355, 1401, 1421 (as amended by Pub. L. 100-223), 1422 through 1431, 1471, 1472, 1502, 1510, 1522, and 2121 through 2125; Articles 12, 29, 31, and 32(a) of the Convention on International Civil Aviation (61 Stat. 1180); 42 U.S.C. 4321 et seq; E.O. 11514; Pub. L. 100-202; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

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